

9-5-2013

Conceptualization and Design of a Surface Translation Balance Training Device


Annie Djukic
Cleveland State University

Omri Tayyara
Cleveland State University

Deborah Espy
Cleveland State University, D.ESPY@csuohio.edu

Majid Rashidi
Cleveland State University, M.RASHIDI@csuohio.edu

Follow this and additional works at: https://engagedscholarship.csuohio.edu/u_poster_2013

 Part of the [Movement and Mind-Body Therapies Commons](#), and the [Physical Therapy Commons](#)

How does access to this work benefit you? Let us know!

Recommended Citation

Djukic, Annie; Tayyara, Omri; Espy, Deborah; and Rashidi, Majid, "Conceptualization and Design of a Surface Translation Balance Training Device" (2013). *Undergraduate Research Posters 2013*. 14.
https://engagedscholarship.csuohio.edu/u_poster_2013/14

This Article is brought to you for free and open access by the Undergraduate Research Posters at EngagedScholarship@CSU. It has been accepted for inclusion in Undergraduate Research Posters 2013 by an authorized administrator of EngagedScholarship@CSU. For more information, please contact library.es@csuohio.edu.



This digital edition was prepared by MSL Academic Endeavors, the imprint of the Michael Schwartz Library at Cleveland State University.

Conceptualization and design of a surface translation balance training device

College of Sciences and Health Professions

Student Researchers: Annie Djukic; Omri Tayyara

Faculty Advisors: Debbie Espy, PT, Ph.D.; Majid Rashidi, Ph.D.

Abstract

Research supports the idea that dynamic control of both a person's center of mass and base of support are necessary to prevent falls, and that older adults can learn this combined control through specific balance training. Effective balance training requires a large number of repetitions of task-specific practice. Externally induced movements have been employed in balance studies both to test and train balance responses, most often using mechanized surface perturbations. These systems however are quite expensive; therefore, we chose to investigate a more cost effective solution focusing on surface translation for balance training in our lab.

We performed a literature review of balance testing or training studies which had successfully used a translating surface paradigm. The motion parameters and subject characteristics were compiled (Table 1) to arrive at a decision about the parameters to be designed into our device. The device was designed to meet the space and subject use needs, compiled motion parameters, and engineering and safety requirements. A scotch yoke mechanism was chosen as well as a DC Motor and an appropriate gearbox, which were designed to translate, via a steel arm, a plywood and square tubing platform.